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AMENDMENTS IN THE CLAIMS:

1. (Currently Amended) An electromagnetic radiation source, comprising:

an anode and a cathode separated by an anode-cathode space;

electrical contacts for applying a dc voltage between the anode and the cathode and establishing an electric field across the anode-cathode space;

at least one magnet arranged to provide a dc magnetic field within the anode-cathode space generally normal to the electric field;

a plurality of waveguides within the anode respectively having anode-cathode space openings ~~formed~~ along a surface of the anode which defines the anode-cathode space, whereby electrons emitted from the cathode are influenced by the electric and magnetic fields to follow a path through the anode-cathode space and pass in close proximity to the anode-cathode space openings, and wherein the surface of the anode is substantially free of openings to any resonant cavities other than via the anode-cathode space openings; and

a common resonator which receives electromagnetic radiation induced in the anode-cathode space openings as a result of the electrons passing in close proximity to the anode-cathode space openings, and traveling through the respective waveguides into the common resonator via corresponding common resonator end openings of the waveguides, and wherein the common resonator reflects the electromagnetic radiation back towards the anode-cathode space openings and produces oscillating electric fields across each of the anode-cathode space openings at a desired operating frequency, and

wherein the plurality of waveguides comprises waveguides having different electrical lengths to different phasing to the electromagnetic radiation passing therethrough.

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2. (Previously Presented) The source of claim 1, wherein the oscillating electric fields of a particular opening are 180 degrees out of phase with respect to adjacent anode-cathode space openings.

5. (Previously Presented) The source of claim 1, wherein the waveguides having different electrical lengths are comprised of waveguides having different dimensions.

6. (Previously Presented) The source of claim 5, wherein the different dimensions are in an H-plane.

7. (Original) The source of claim 5, wherein the different dimensions are a result of the waveguides having different lengths.

8. (Currently Amended) The source of claim ~~4~~ 1, wherein the difference in electrical length is equal to about one-half λ, where λ represents the wavelength of the operating frequency.

9. (Original) The source of claim 1, wherein:

the cathode is cylindrical having a radius rc;

the anode is annular-shaped having a radius ra and is coaxially aligned with the cathode to define the anode-cathode space with a width wa=ra-rc; and

a circumference 2 π ra of the surface of the anode is greater than λ, where λ represents the wavelength of the operating frequency.

10. (Currently Amended) The source of claim 1, wherein the anode comprises a plurality of wedges arranged side by side to form a hollow-shaped cylinder having the anode-cathode space located therein, and each of the wedges comprises a first recess which defines at least in part a waveguide among the plurality of waveguides with an anode-cathode opening exposed to the anode-cathode space.

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18. (Previously Presented) An electromagnetic radiation source, comprising:

an anode and a cathode separated by an anode-cathode space;

electrical contacts respectively attached to the anode and cathode for applying a dc voltage between the anode and the cathode and establishing an electric field across the anode-cathode space;

at least one magnet arranged to provide a dc magnetic field within the anode-cathode space generally normal to the electric field;

an array comprising N pin-like electrodes providing at least a part of the anode and arranged in a pattern to define the anode-cathode space; and

at least one common resonant cavity in proximity to the N electrodes,

wherein the N electrodes are spaced apart with openings therebetween, and electrons emitted from the cathode are influenced by the electric and magnetic fields to follow a path through the anode-cathode space and pass in close proximity to the openings to establish a resonant electromagnetic field within the at least one common resonant cavity, and

a circumference of the pattern of N electrodes defining the anode-cathode space being greater than λ, where λ represents the wavelength of the operating frequency of the electromagnetic radiation source.

19. (Currently Amended) The source of claim 18, wherein the cathode is generally cylindrically shaped about an axis, and the N electrodes provide at least one cylindrical cage coaxially around the cathode.

20. (Currently Amended) The source of claim 19, wherein the at least one cylindrical cage includes a plurality of cylindrical cages, and the N electrodes provide a the plurality of cylindrical cages coaxially around the cathode, the plurality of cylindrical cages being stacked one upon another.

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21. (Currently Amended) The source of claim 19, wherein the N electrodes are aligned parallel with the axis.

22. (Original) The source of claim 19, wherein N/2 of the electrodes originate from a lower part of the anode-cathode space and the remaining N/2 of the electrodes originate from an upper part of the anode-cathode space.

23. (Currently Amended) The source of claim 22, wherein the N/2 electrodes originating from the lower part of the anode-cathode space are interdigitated with the N/2 electrodes originating from the upper part of the anode-cathode space.

24. (Currently Amended) The source of claim 23, wherein the N electrodes are tied to a fixed dc potential to establish the electric field, and ac potentials are induced on the N electrodes by the resonant electromagnetic field.

25. (Original) The source of claim 24, wherein the ac potentials induced on adjacent interdigitated electrodes are respectively 180 degrees out-of-phase.

26. (Previously Presented) The source of claim 23, wherein the N electrodes are patterned from a conductive layer formed on a tube.

27. (Original) The source of claim 23, wherein the upper and lower parts of the anode-cathode space are respectively defined by upper and lower magnetic pole pieces.

28. (Previously Presented) The source of claim 27, wherein the N electrodes are electrically and mechanically coupled to a corresponding pole piece.

29. (Previously Presented) The source of claim 27, wherein the N electrodes are electrically isolated from a corresponding pole piece.

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30. (Previously Presented) The source of claim 27, wherein the pole pieces define a waveguide between the N electrodes and the at least one common resonant cavity.

31. (Original) The source of claim 30, wherein the waveguide is approximately an integer multiple of $\lambda/2$ in length, where λ is the wavelength of the frequency of the resonant magnetic field.